The Nature of Scientific Discovery ed. by Owen Gingerich (review)

John Scott Willson

Leonardo, Volume 11, Number 3, Summer 1978, p. 241 (Review)

Published by The MIT Press

Leonardo, Vol. 11, pp. 241–257.

0024—094X/78/0701—0241$02.00/0

BOOKS

Readers are invited to recommend books to be reviewed. In general, only books in English and in French can be reviewed at this stage.

Those who would like to be added to Leonardo's *panel of reviewers should write to the Founder-Editor, indicating their particular interests.*

The Nature of Scientific Discovery. Owen Gingerich, ed. Smithsonian Institution Press, Washington, D.C., 1975. 616 pp., illus. $15.00. Reviewed by **John Scott Willson***

In 1973 the Smithsonian Institution and the National Academy of Sciences organized an International Symposium in celebration of the 500th anniversary of the birth of Nicolaus Copernicus. This book is a detailed record of the proceedings of the symposium and of the events that took place in the associated festival. Unfortunately the title is rather misleading, as it implies that science in general is to be discussed, whereas much of the book is about various aspects of the period in which Copernicus lived. Although relativity and cosmology are considered in detail, other aspects of modern science, such as chemistry and biology, are barely mentioned. A title that reflected this bias towards astronomy and the Renaissance would have been much more helpful to prospective readers.

In the first part of the book the opening ceremonies and speeches are reported and details are given of the stamps, music and art which were produced to commemorate the anniversary. This festival section also includes some of the text and pictures from a Charles Eames slide show depicting prints, manuscripts and buildings associated with Copernicus. The second part consists of 10 papers presented by highly qualified astronomers, historians, and philosophers including Werner Heisenberg and Jacob Bronowski. The topics range from the nature and interaction of Renaissance science and society to the traditions influencing modern science and to the theoretical developments that may become dominant in the future.

One essay about the identification and implications of quasars is extremely illuminating, but the final paper concerning the nature of the universe is very difficult to follow. Abstracts accompanying each paper would have been useful, as many readers may miss important points by skipping over perplexing passages or by completely abandoning a paper after just a few pages.

The rest of the book consists of edited stenographic transcripts of the discussions between many other scholars who met in collegia during the three days of the symposium. Although Gingerich states that these records have been severely pruned of redundancies to produce a more polished account of the proceedings, they still contain many annoying trivialities, such as verbatim reports of introductions, private jokes and votes of thanks. The accounts are accompanied by many illustrations that are interesting but are rarely directly relevant to the adjacent text.

One collegium concentrated on the science and society of the sixteenth century. They discussed the causes of the great expansion in innovation, the influence of church and state on publications and the roles of Rheticus, Osiander and Melanchthon in the propagation of Copernican theories. A second group analyzed the relationships between science, literature and the arts, the processes of discovery in these fields and the misuse of the concept of revolution. The third collegium considered the nature of truth and reality in science and the ethics involved in discovery and progress. Readers who are not familiar with philosophical concepts such as nominalism, mutability and the principle of self-reference will find this section extremely heavy going. Indeed only those readers who have an extremely broad education will be acquainted with the complete vocabulary of the book. Many scientists will stumble over the numerous classical quotations, while the philosophers, who use their own jargon liberally, will be puzzled by unexplained astronomical terms such as equant, epicycle and syzygy.

The book will probably be purchased by many of the people who were present at the symposium and will be of great value to other academics concerned with the history and philosophy of science. Students of astronomy and of the Renaissance will also discover some useful items but, apart from these specialised areas the book will be of little interest to general readers.

The Force of Knowledge: The Scientific Dimension of Society. John Ziman. Cambridge University Press, London, 1976. 374 pp., illus. £7.50. Reviewed by **James A. Goldman****

His left arm resting on the shoulder of what appears to be a simian skeleton, a youthful biology student poses for a photographer. It is this portrait of H. G. Wells that has been selected for the front of the book jacket of a book whose theme is the social relations of science and technology.

Wells's original faith in the inevitable progress of mankind was representative of the general outlook of many educated people at that time regarding the inherently beneficial value of scientific progress. After World War I, however, Wells became disillusioned with such utopian attitudes and, viewing the future as 'a race between education and catastrophe', he endeavored to provide to the general public what he considered to be the essentials of knowledge required for coping with the problems of society. In 1920 there appeared his best-selling *Outline of History*. Wells was still convinced then that humans could progress if they adapted themselves to the changing environment. For this, knowledge and, therefore, education assumed paramount importance. Yet some 20 years afterward, Wells, despite continued prodigious writing for this purpose, became basically pessimistic about the prospects for the future, as evidenced in his short essay entitled *Mind at the End of Its Tether*.

This predicament still confronts mankind in the last quarter of the 20th century. The promises of scientific and technological ingenuity, frequently it seems, produce accompanying risks that usually evade accurate assessment. For the rational judgement of these risks, it is imperative that the structure and functioning of the contemporary scientific enterprise be comprehensible to science teachers and science students, and indeed to each citizen. The impetus toward specialization in science at the same time that research is increasingly becoming interdisciplinary and 'Big Science' in character means that practicing scientists especially should be broadly aware of the social aspects of science.

*The Manchester Grammar School, Old Hall Lane, Manchester M13 0XT, England.

**Division of Continuing Education and Extension Services, New York City Community College, City University of New York, 300 Jay St., Brooklyn, NY 11201, U.S.A.